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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,834	06/30/2003	Ashay A. Dani	884.945US1	3862

21186 7590 12/01/2005

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MINNEAPOLIS, MN 55402

EXAMINER
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MCKINNON, TERRELL L

ART UNIT	PAPER NUMBER
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3753

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/612,834	Applicant(s) DANI ET AL.	
	Examiner Terrell L. Mckinnon	Art Unit 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/12/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-11, 14-17, 19, 21-23, 26, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toy et al. (U.S. 5,931,222) in view of Vitas et al. (U.S. 6,751,099).

Toy's invention discloses all of the claimed limitations from above, (column 3, 52-60, column 4, lines 22-65, column 5, lines 1-5 and 20-23 and 41-60, column 6, lines 14-30 and lines 61 through column 7 line 31), except for except for the two metals are one or more of the combinations of Ni/Au, Ni/Ag, Cu/Au, Cu/Ag and Cu/Ni; a design effective for bonding to solder and for adhering to polymer in a polymer solder hybrid; the design is a checkered square grid; circles; a bull's Eye; corner Squares and/or a central Square.

3. However, Vitas teaches a heat dissipating device wherein two metals are one or more of the combinations of Ni/Au, Ni/Ag, Cu/Au, Cu/Ag and Cu/Ni; a design effective for bonding to solder and for adhering to polymer in a polymer solder hybrid (column 2, lines 36-47, column 2, lines 66 through column 3, line 18, column 3; lines 14-30, and column 4, lines 6-12).

Given the teachings of Vitas, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat dissipating device of Toy with a heat dissipating device wherein two metals are one or more of the combinations of Ni/Au, Ni/Ag, Cu/Au, Cu/Ag and Cu/Ni; a design effective for bonding to solder and for adhering to polymer in a polymer solder hybrid; the design is a checkered square grid; circles; a bull's Eye; corner Squares and/or a central Square.

Doing so would provide a design and combination of materials, which have excellent heat transferring characteristics for cooling heat-generating devices.

4. Claims 12, 13, 18, 20 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toy et al. (U.S. 5,931,222) in view of Vitas et al. (U.S. 6,751,099) as applied to claims above, and further in view of McCullough (U.S. 6,803,328)

Toy's invention, as modified by Vitas, discloses all of the claimed limitations from above except for adding channels or serrations to the surface of the heat dissipating device; adhering and bonding the thermal interface material to the surface; and the channels or grooves or channels and grooves increase the surface area of the heat dissipating device that is contacted by the thermal interface material; and perturbations.

5. However, McCullough teaches the use of channels or serrations to the surface of the heat dissipating device; adhering and bonding the thermal interface material to the surface; and the channels or grooves or channels and grooves increase the surface area of the heat dissipating device that is contacted by the thermal interface material; and perturbations (see Figs).

Art Unit: 3753

Given the teachings of McCullough, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the heat dissipating device of Toy with channels or serrations to the surface of the heat dissipating device; adhering and bonding the thermal interface material to the surface; and the channels or grooves or channels and grooves increase the surface area of the heat dissipating device that is contacted by the thermal interface material; and perturbations.

Doing so would improve the thermal dissipation of the dissipating device.

6. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toy et al. (U.S. 5,931,222) in view of Vitas et al. (U.S. 6,751,099) as applied to claims above, and further in view of Kao et al. (U.S. 6,602,777)

Toy's invention, as modified by Vitas, discloses all of the claimed limitations from above except for solder being applied by intermetallic compound formation and solder is pre-attached by cold forming.

7. However, Kao teaches the use of solder being applied by intermetallic compound formation (see abstract)

Given the teachings of Kao, it would have been obvious to one of ordinary skill in the art at the time of the invention to furthermore modify the cooling method of Toy with the use of solder being applied by intermetallic compound formation and solder is pre-attached by cold forming.

Doing so would provide an alternate means of applying solder between two thermally conductive members.

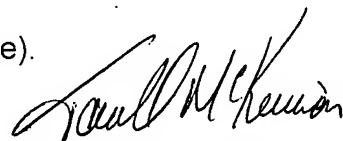
Art Unit: 3753

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L. Mckinnon whose telephone number is 571-272-4797. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Blau can be reached on 571-272-4406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Terrell L Mckinnon  
Primary Examiner  
Art Unit 3753  
November 28, 2005